NEW ALGORITHM DESIGN FOR IMAGE RECOGNITION USING SOFT COMPUTING TECHNIQUES

For Degree of Philosophy in Computer Science
Under faculty of Science & Technology

Synopsis
Submitting to
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1. Introduction :

Digital image play a vital role, each in lifestyle applications like television system, resonance imaging, pc imaging also as in areas of analysis and technology like geographical data systems and uranolog. A digital image could be a numeric illustration of an image. Digital image process refers to the manipulation of an image by means that of a processor. the various space of image process system includes Image Matching, Image improvement, Image Restoration, Image Segmentation, Image Mosaic, Image Registration, Image Watermarking, compression, Image Fusion, Image In painting, Super Resolution & Image Retrieval.

Image Recognition is that the one in all most up-to-date analysis space in image process, this can be difficult task as a result of matching within the presence of outliers, matching within the presence of noise, recognition of geometrically, measuring remodeled images,
scale images, read purpose modification and looking images in guid e information. Image matching utilized in computer vision for object chase, remote sensing process, image recognition, scene navigation and medical image analysis etc. thanks to diversity of image acquisition manner and application areas, image matching has gotten abundant recent attention to analysis. Image matching could be a key technique in several applications, like pattern recognition, air navigation, computer vision, image recognition and looking of

image within the information. The image matching ought to be chosen relying upon the appliance space during which it to be applied.

2. Review of Literatures:

1. Yi-Hsing Tseng, Jin-John Tzen, Kei-Pay Tang and Shin-Hung Lin, Photogrammetric Engineering & Remote Sensing Vol. 63, No. 8, August **1997**,pp 975-983, "Image-to-Image Registration by Matching Area Features Using Fourier Descriptors and Neural Networks ".

   It presented an image-to image registration is distributed mechanically in software package. The planned approach uses a feature-based matching with the constraints of orientation consistency and matched match. The approach is enforced by matching space options mistreatment Fourier descriptors and finding conjugate options mistreatment neural network system.

2. M. Egmont-Petersen, D. de Ridder, H. Handels, "Image processing with neural networks – a review", Elsevier Science, **2001.**

   These paper quite two hundred applications of neural networks in image process and discuss the current and possible future role of neural networks, particularly feed-forward neural networks, Kohonen feature maps and Hopfield neural networks. the assorted applications area unit categorized into a completely unique two-dimensional taxonomy for image process algorithms. One dimension specifies the kind of task performed by the algorithm: preprocessing, information reduction/ feature extraction, segmentation, beholding, image understanding and improvement. the opposite dimension captures the abstraction level of the computer file processed by the algorithm: pixel-level, native feature-level, structure level,

object-level, object-set level and scene characterization. every of the six styles of tasks poses specific constraints to a neural-based approach. These specific conditions area unit mentioned thoroughly. A synthesis is created of unresolved problems associated with application of pattern recognition techniques in image process and specifically to the appliance of neural networks. Finally, we have a tendency to gift associate outlook into the longer term application of neural networks and relate them to novel developments.

3. Kay Boehnke, Marius Otesteanu, Philipp Roebrock, Wolfgang Winkler,Werner Neddermeyer, "Neural Network Based Object Recognition Using Color Block Matching", International Conference Signal Processing, Pattern Recognition, And Applications Feb 14-16,**2007**,Austria.

   It presented a system for quick colour classification is given victimization associate optimized neural network. Additionally to the delineate application in chapter this rule can be used as a digital filter or in image segmentation task. The most advantage of the rule is its generality; therefore the resolution can attains good leads to several sorts of future applications.

4. Bharathi P. T , Dr. P. Subashini, "Optimization Of Image Processing Techniques Using Neural Networks –A Review", Wseas Transactions On Information Science And Applications, Issue 8, Vol 8, Augest **2011.**

   It focuses on the survey consistent with the six steps within the image process. Neural network are trained to perform six steps, image process, information reduction, image segmentation, visual perception, image understanding and image optimization. A

synthesis is created of unresolved issues associated with the appliance of pattern recognition techniques in image process and specifically to the appliance of neural networks.

5. Nazil Perveen, Darshan Kumar and Ishan Bhardwaj, " An Overview on Template Matching Methodologies and its Applications", International Journal of Research in Computer and Communication Technology, Vol 2, Issue 10, October- **2013.**

   This paper describes totally different economical technique that has been already enforced and have smart application rate in their various fields with their consequences that facilitate authors to need a summary of various model matching algorithmic rule and its applications.

6. Kaiming He, Xiangyu Zhang, Shaoqing Ren ,Jian Sun, "Deep Residual Learning for Image Recognition", Microsoft Research,**2015.**

   This paper, Deeper neural networks are more difficult to train. We present a residual learning framework to ease the training of networks that are substantially deeper than those used previously. We explicitly reformulate the layers as learning residual functions with reference to the layer inputs, instead of learning unreferenced functions. We provide comprehensive empirical evidence showing that these residual networks are easier to optimize, and can gain accuracy from considerably increased depth. On the Image Net dataset we evaluate residual nets with a depth of up to 152 layers—8× deeper than VGG nets but still having lower complexity. An ensemble of these residual nets achieves 3.57% error on the Image Net test set. This result won the 1st place on the ILSVRC 2015 classification task. We also present analysis on CIFAR-10 with 100 and 1000 layers. The depth of representations is of central importance for many visual recognition tasks. Solely due to our extremely deep representations, we obtain a

28% relative improvement on the COCO object detection dataset. Deep residual nets are foundations of our submissions to ILSVRC & COCO 2015 competitions1, where we also won the 1st places on the tasks of Image Net detection, Image Net localization, COCO detection, and COCO segmentation.

7. R.Vigneshwar, Ms.V.Prema, "Colour Recognition in Images Using Neural Networks", International Journal of Innovative Research in Computer and Communication Engineering, Vol. 4, Issue 2, February **2016.**

   It focuses on the wide selection of applications of color recognition attracts the eye of enormous range of researchers to unveil numerous depths in it. a number of the appliance areas of color recognition are road sign identification, location discovering so on. We tend to devise a brand new methodology during this paper for recognizing the color in pictures of RGB color house with the assistance of neural networks custom for each color. Those specialized neural networks ar building blocks for the hierarchical structures. each normal and hierarchical neural networks are tested with numerous knowledge sets to match the outcomes of those systems.

8. Jure Zbontar, Yann Lecun, Journal of Machine Learning Research **2016**, pp 1-32, "Stereo Matching by Training a Convolutional Neural Network to Compare Image Patches".

   It conferred an identical price computation of stereo algorithmic program. Here binary classification information set of comparable and dissimilar combine of patches is made for coaching Convolutional Neural Network. For obtaining

stereo matching price, output of standard Neural Network is employed.

9. V.V. Knaiz, V.V. Fedorenko, N.A. Formin, The International Archives of the Photogrammetric, Remote Sensing and Spatial Information Sciences, Vol. XLII-2, 4 Jun **2018**, pp 513-518, "Deep Learning for Low Textured Image Matching".

   It planned on Wide Image Zone adjective sturdy Feature Descriptor (WIZARD) victimization deep learning is developed. During this standard auto-encoder is employed for retrieval of the discriminative image options. In this, code is intended to perform purpose matching on multiple pictures. Matching is completed victimization nearest neighbor search and a changed option algorithmic rule.

3. Objectives of Research:

- To study various technologies available for 2D Image Recognition and design, develop a new method using soft computing techniques.
- To test the developed tool under varying circumstances

4. Methodology to be adopted:

The projected analysis work involves study of the image process, Two and stereo image recognition. The designing and development of new algorithm for two dimensional image recognition using soft computing technique. Also by using software tools such as SCILAB/MATLAB, the method will be implemented. The specified knowledge assortments are going to be either performed by victimization out there info on the web or manually sure info are going to be created.

5. Importance of study:

i) International status:

Over the last twenty years, Image Recognition has become a popular area of research in computer vision and one of the most successful applications of image analysis and understanding. Because of the nature of the problem, not only computer science researchers are interested in it, but neuroscientists and psychologists also. It is the general opinion that advances in computer vision research will provide useful insights to neuroscientists and psychologists into how human brain works and vice versa.

ii) Significance of the study:

- A lot of research work is carried in the area of 2D Image Recognition
- In India we find that very few people are contributing in the area of Image Recognition
- Image Matching is still not 100% achieve, so there is scope for contribution in this area.

6. Proposed work Plan:

Year-wise Plan of work and targets to be achieved:

I.2019-2020:

- Collection of Research Papers
- Complete Course Work.
- Study of SCILAB/MATLAB software.

II.2020-2021:

- Manually certain database will be created.
- Collection of Research Papers
- One or two research papers published.

III. 2021-2022:

- Study of soft computing techniques.
- Feature extraction techniques implemented in SCILAB/MATLAB software.
- New 2D Image Recognition algorithms is developed using soft computing techniques.
- Test developed algorithms in different circumstances.
- One or two research papers published.

7. References

1. Yi-Hsing Tseng, Jin-John Tzen, Kei-Pay Tang and Shin-Hung Lin, Photogrammetric Engineering & Remote Sensing Vol. 63, No. 8, August **1997**,pp 975-983, "Image-to-Image Registration by Matching Area Features Using Fourier Descriptors and Neural Networks ".
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6. Kaiming He, Xiangyu Zhang, Shaoqing Ren ,Jian Sun, "Deep Residual Learning for Image Recognition", Microsoft Research,**2015.**
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